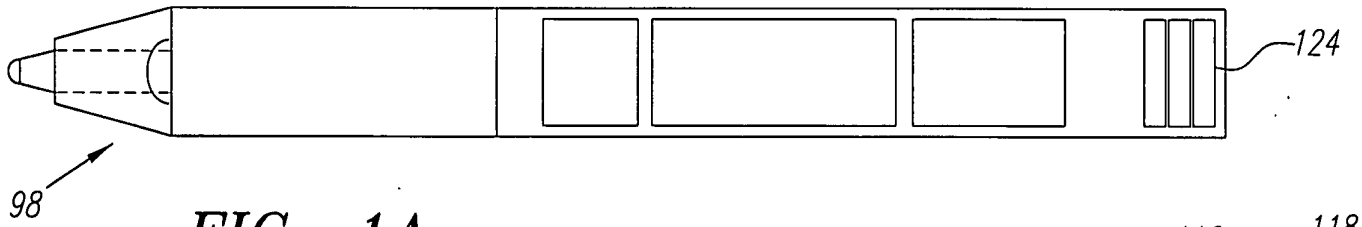


FIG. 1A

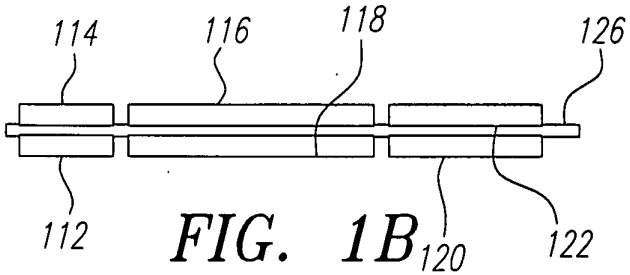


FIG. 1B

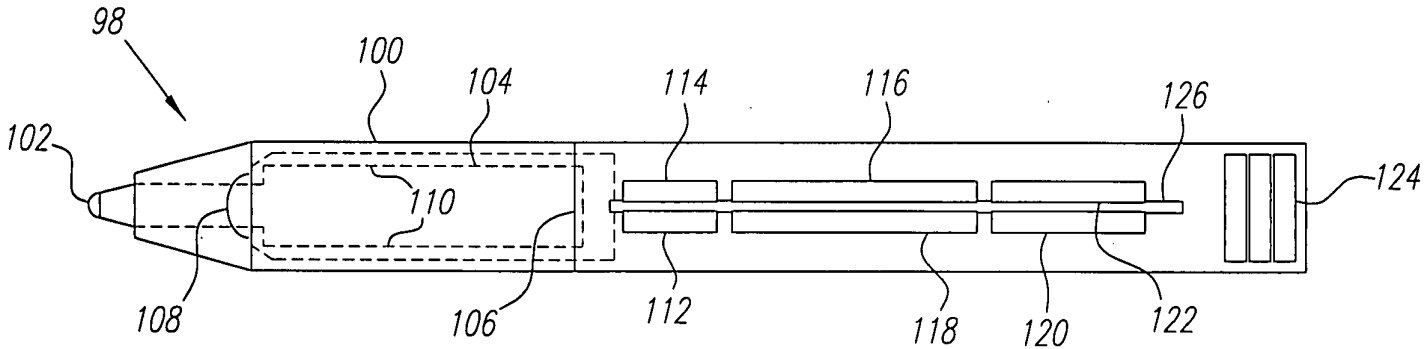


FIG. 1C

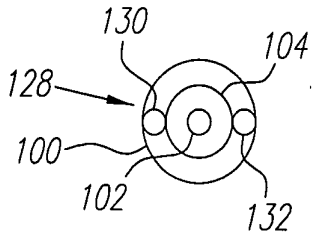


FIG. 1D

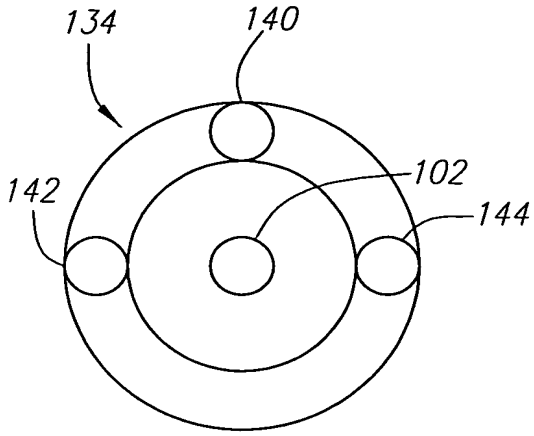


FIG. 1E

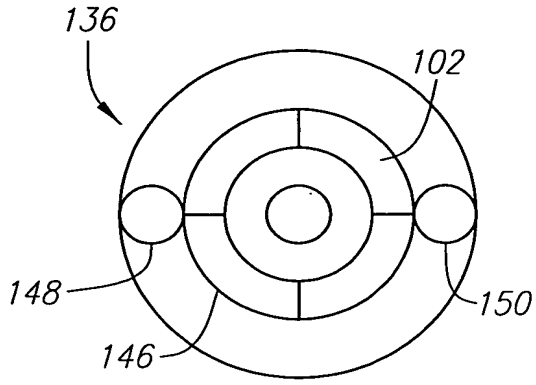


FIG. 1F

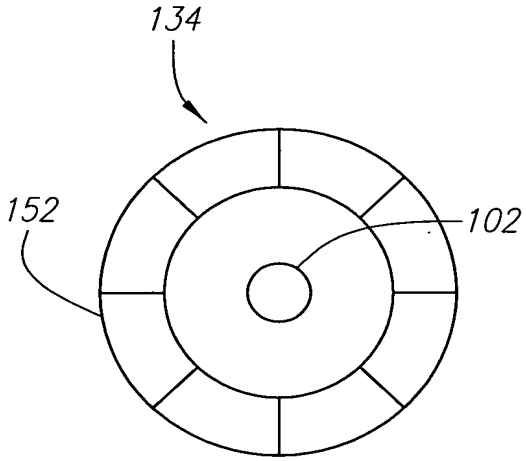


FIG. 1G

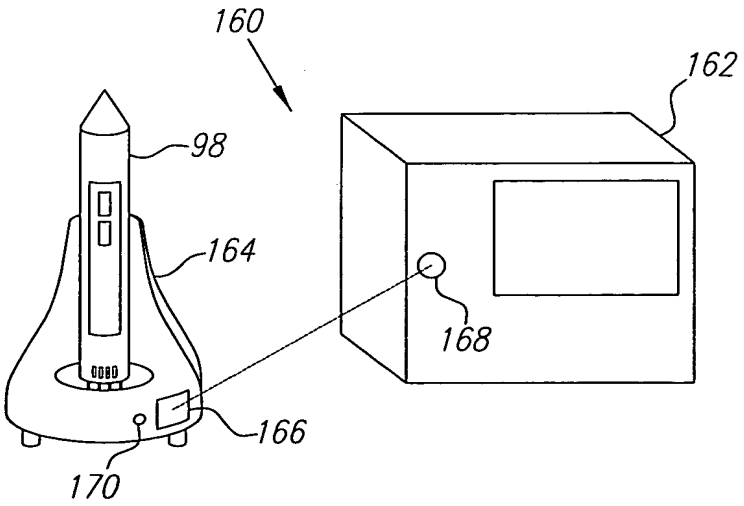


FIG. 1H

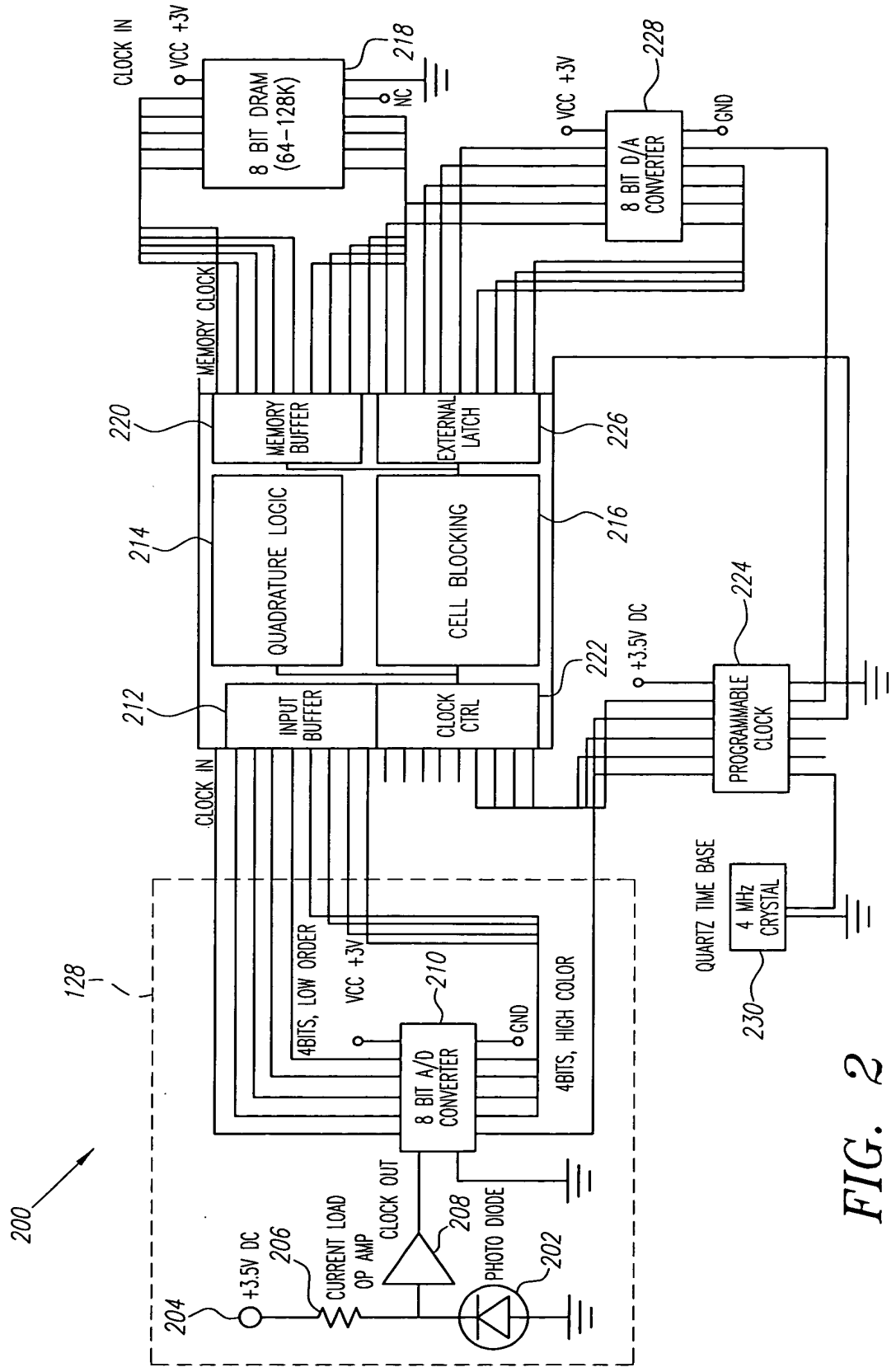

200
128
CLOCK IN
VCC +3V
8 BIT DRAM (64–128K)
218
NC
VCC +3V
228
8 BIT D/A CONVERTER
GND
MEMORY CLOCK
220
MEMORY BUFFER
EXTERNAL LATCH
226
214
QUADRATURE LOGIC
CELL BLOCKING
216
224
+3.5V DC
212
INPUT BUFFER
CLOCK CTRL
222
PROGRAMMABLE CLOCK
CLOCK IN
4BITS, LOW ORDER
VCC +3V
210
GND
4BITS, HIGH COLOR
8 BIT A/D CONVERTER
QUARTZ TIME BASE
4 MHz CRYSTAL
230
CLOCK OUT
208
PHOTO DIODE
202
+3.5V DC
206
CURRENT LOAD OP AMP
204

FIG. 2

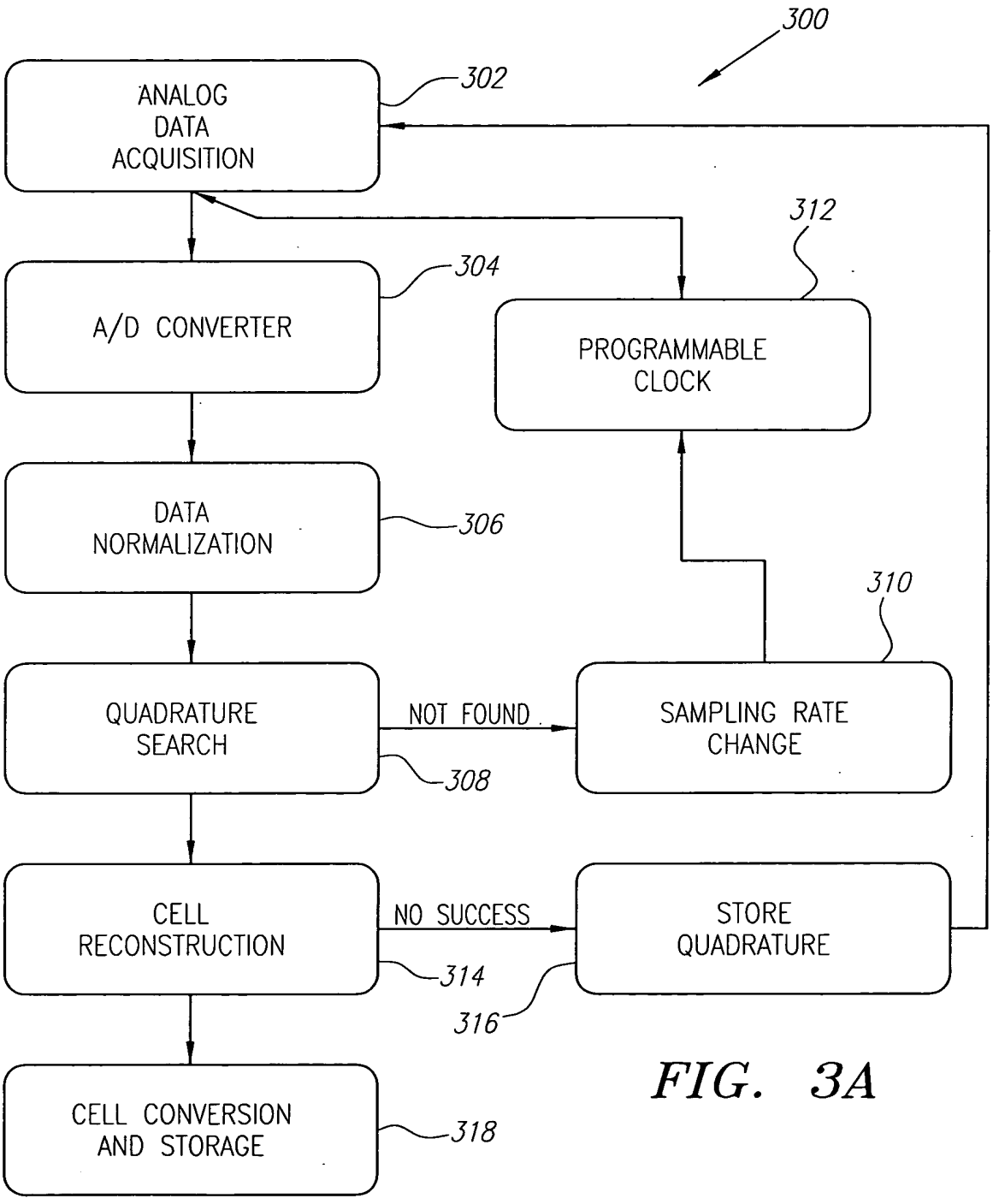

300
ANALOG DATA ACQUISITION
302
A/D CONVERTER
304
DATA NORMALIZATION
306
QUADRATURE SEARCH
308
NOT FOUND
CELL RECONSTRUCTION
314
NO SUCCESS
316
CELL CONVERSION AND STORAGE
318
PROGRAMMABLE CLOCK
312
SAMPLING RATE CHANGE
310
STORE QUADRATURE

FIG. 3A

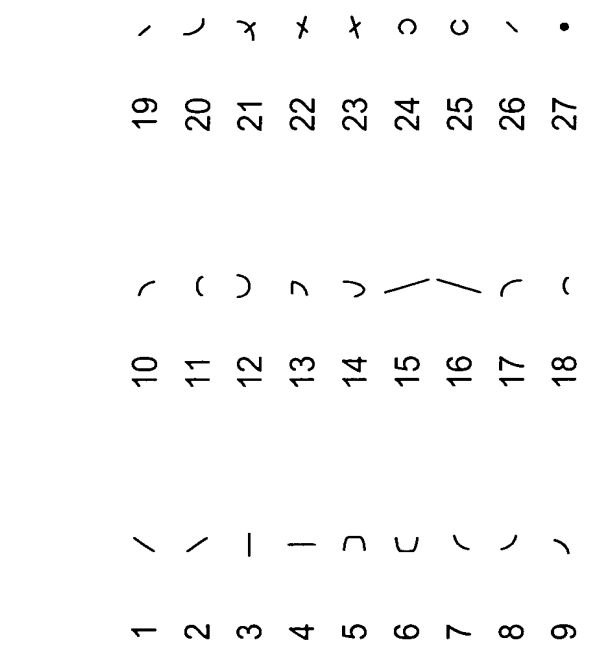


FIG. 3B

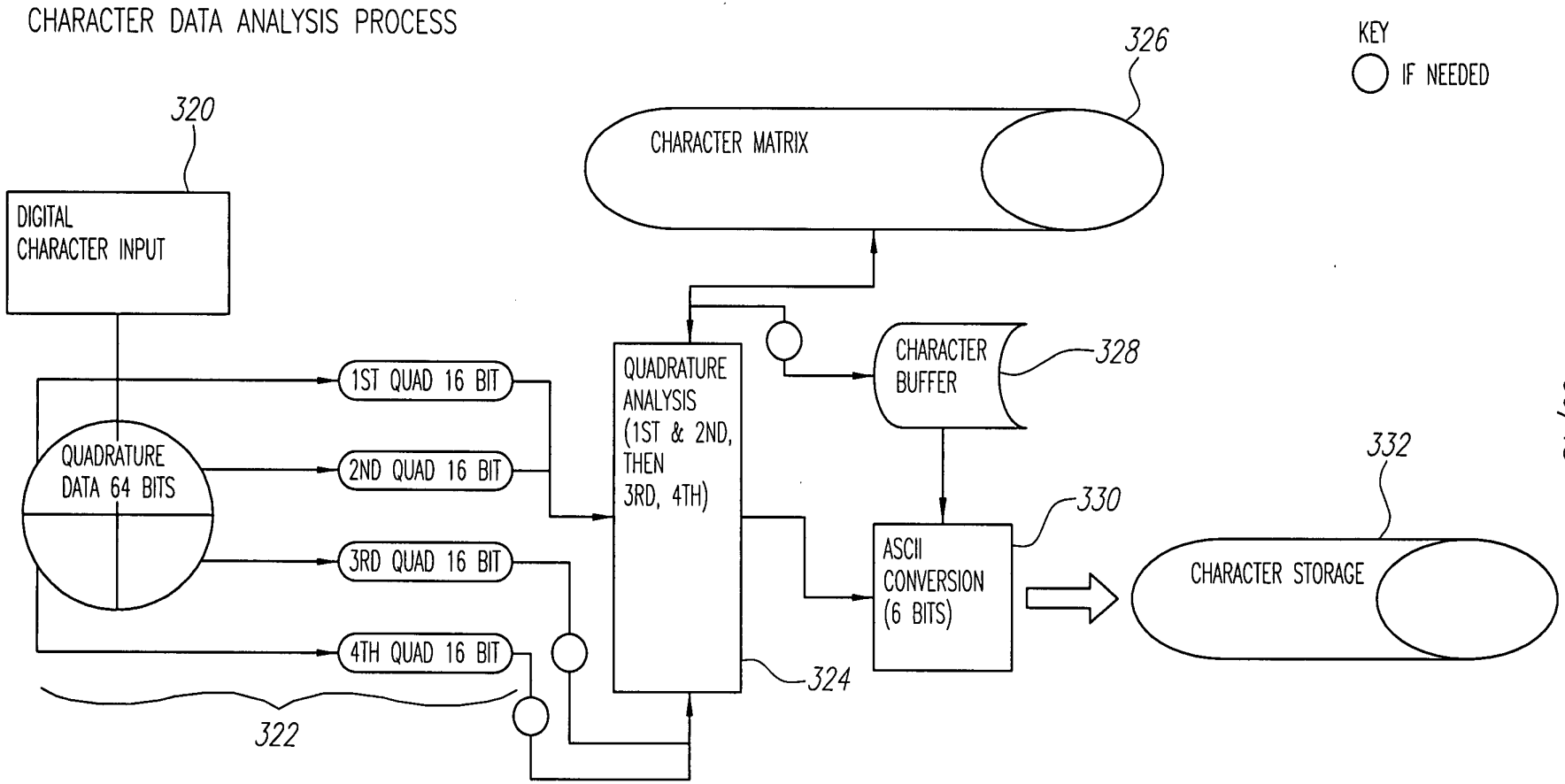

CHARACTER DATA ANALYSIS PROCESS
KEY
IF NEEDED
320
DIGITAL CHARACTER INPUT
326
CHARACTER MATRIX
328
CHARACTER BUFFER
1ST QUAD 16 BIT
2ND QUAD 16 BIT
3RD QUAD 16 BIT
4TH QUAD 16 BIT
QUADRATURE DATA 64 BITS
QUADRATURE ANALYSIS (1ST & 2ND, THEN 3RD, 4TH)
322
324
330
ASCII CONVERSION (6 BITS)
332
CHARACTER STORAGE

FIG. 3C

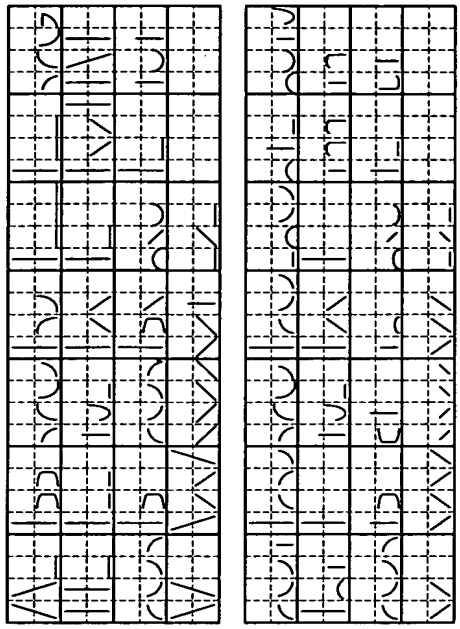


FIG. 3E

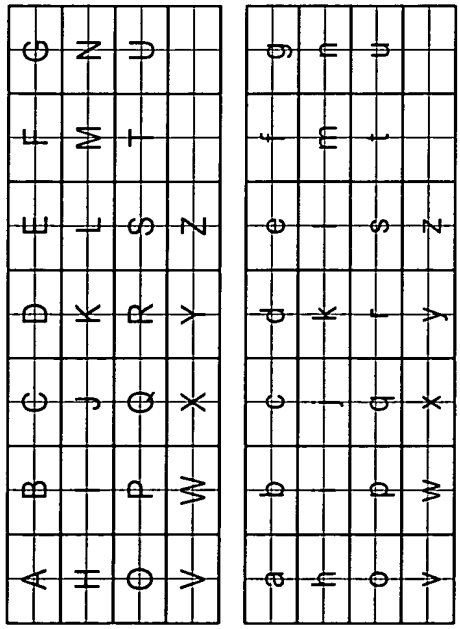


FIG. 3D

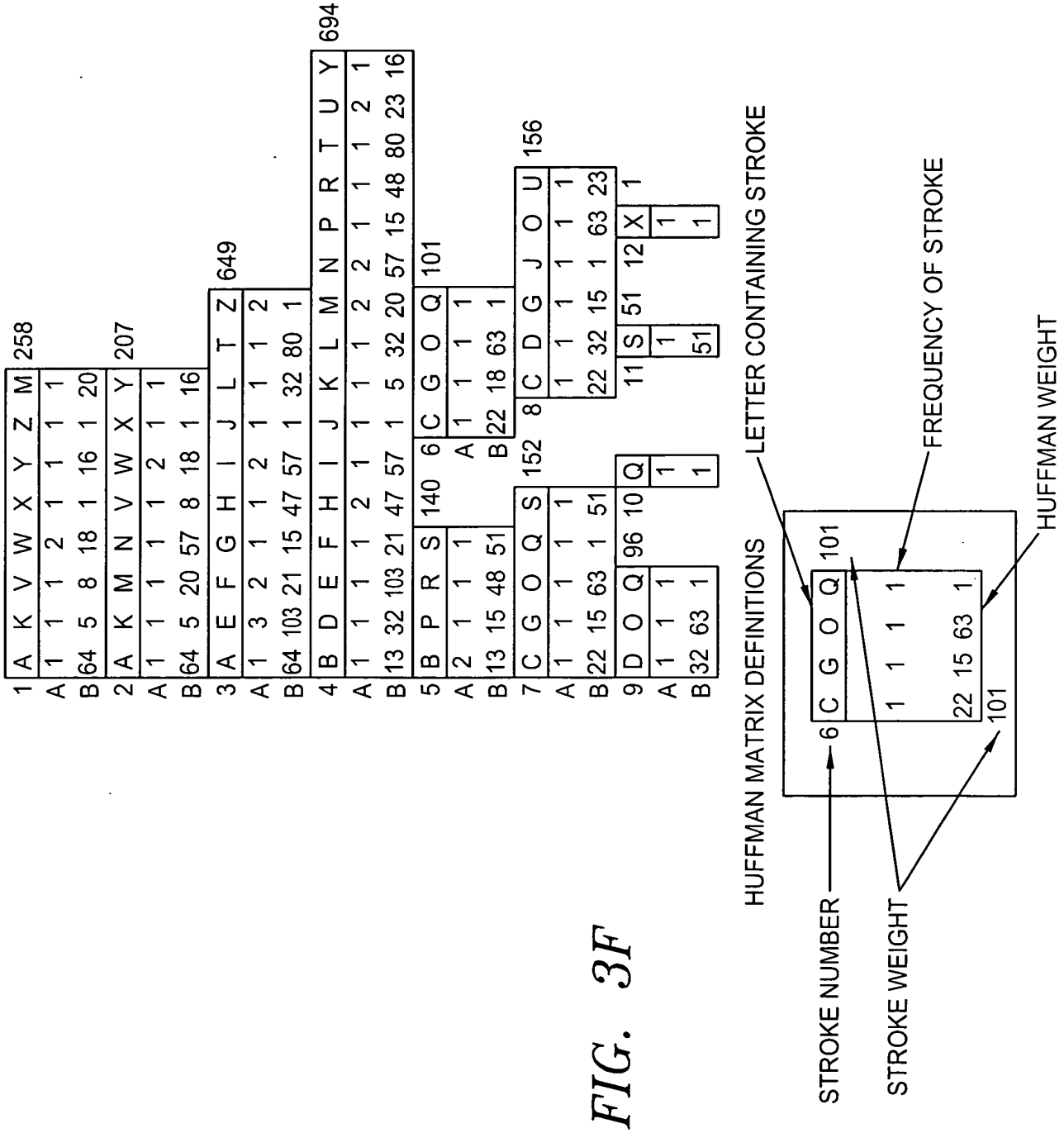

1 A K V W X Y Z M 258
A 1 1 1 2 1 1 1 1
B 64 5 8 18 1 16 1 20
2 A K M N V W X Y 207
A 1 1 1 1 1 2 1 1
B 64 5 20 57 8 18 1 16
3 A E F G H I J L T Z 649
A 1 3 2 1 1 2 1 1 1 2
B 64 103 21 15 47 57 1 32 80 1
4 B D E F H I J K L M N P R T U Y 694
A 1 1 1 1 2 1 1 1 1 2 2 1 1 1 2 1
B 13 32 103 21 47 57 1 5 32 20 57 15 48 80 23 16
5 B P R S 140 6 C G O Q 101
A 2 1 1 1 A 1 1 1 1
B 13 15 48 51 B 22 18 63 1
7 C G O Q S 152 8 C D G J O U 156
A 1 1 1 1 1 1 1 1 1 1 1 1 1 1
B 22 15 63 1 51 22 32 15 1 63 23
9 D O Q 96 10 Q 11 S 51 12 X 1
A 1 1 1 1 1 1 1
B 32 63 1 51 1
HUFFMAN MATRIX DEFINITIONS
LETTER CONTAINING STROKE
FREQUENCY OF STROKE
HUFFMAN WEIGHT
STROKE NUMBER
STROKE WEIGHT
6 C G O Q 101
1 1 1 1
22 15 63 1
101

FIG. 3F

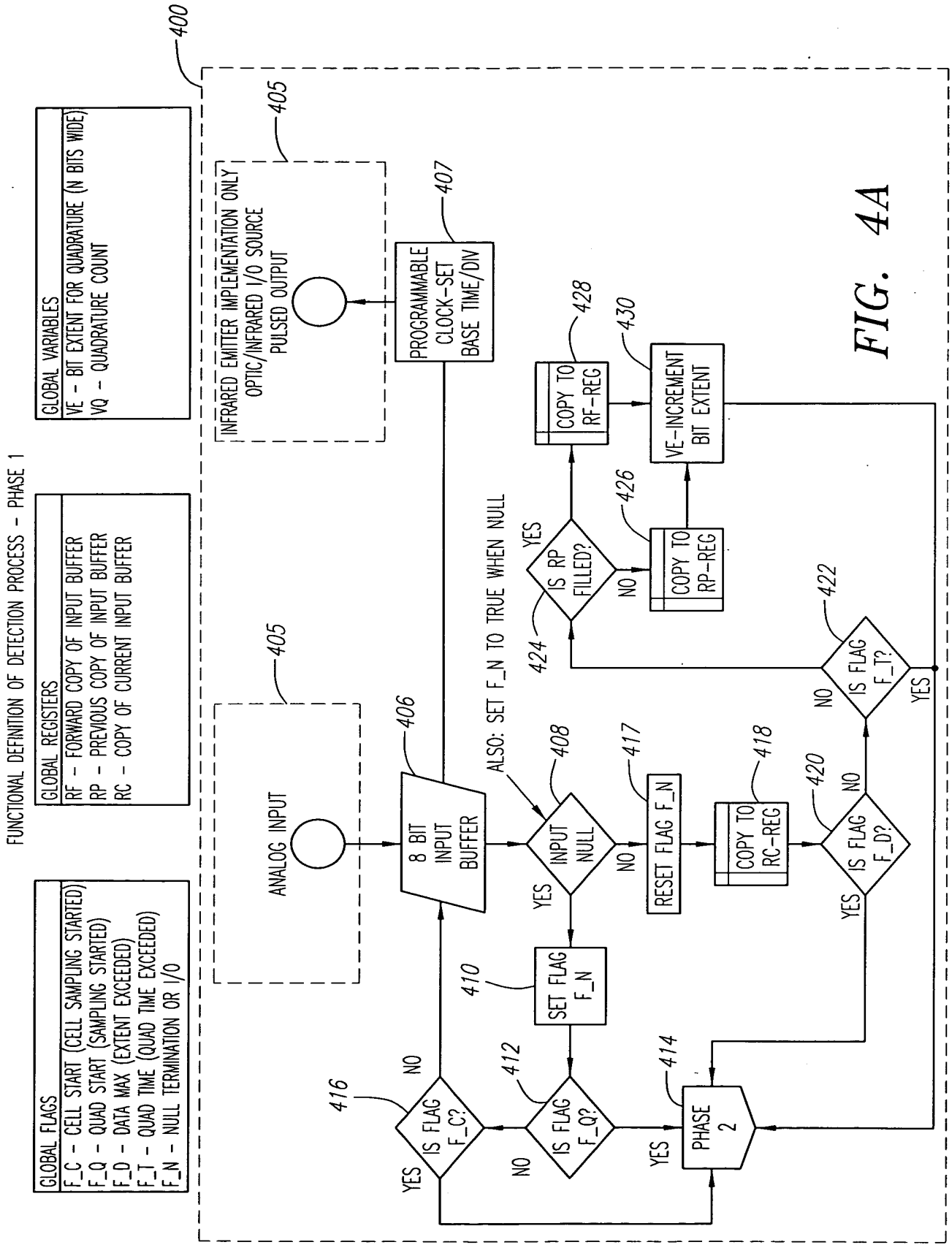

400
FUNCTIONAL DEFINITION OF DETECTION PROCESS - PHASE 1
GLOBAL FLAGS
F_C - CELL START (CELL SAMPLING STARTED)
F_Q - QUAD START (SAMPLING STARTED)
F_D - DATA MAX (EXTENT EXCEEDED)
F_T - QUAD TIME (QUAD TIME EXCEEDED)
F_N - NULL TERMINATION OR I/O
GLOBAL REGISTERS
RF - FORWARD COPY OF INPUT BUFFER
RP - PREVIOUS COPY OF INPUT BUFFER
RC - COPY OF CURRENT INPUT BUFFER
GLOBAL VARIABLES
VE - BIT EXTENT FOR QUADRATURE (N BITS WIDE)
VQ - QUADRATURE COUNT
405
INFRARED EMITTER IMPLEMENTATION ONLY
OPTIC/INFRARED I/O SOURCE
PULSED OUTPUT
407
PROGRAMMABLE CLOCK-SET BASE TIME/DIV
405
ANALOG INPUT
406
8 BIT INPUT BUFFER
ALSO: SET F_N TO TRUE WHEN NULL
408
INPUT NULL
YES
NO
417
RESET FLAG F_N
418
COPY TO RC-REG
420
IS FLAG F_D?
YES
NO
422
IS FLAG F_T?
NO
YES
424
IS RP FILLED?
YES
NO
426
COPY TO RP-REG
428
COPY TO RF-REG
430
VE-INCREMENT BIT EXTENT
410
SET FLAG F_N
412
IS FLAG F_Q?
NO
YES
414
PHASE 2
416
IS FLAG F_C?
YES
NO

FIG. 4A

GLOBAL FLAGS
F_C – CELL START (CELL SAMPLING STARTED)
F_Q – QUAD START (SAMPLING STARTED)
F_D – DATA MAX (EXTENT EXCEEDED)
F_T – QUAD TIME (QUAD TIME EXCEEDED)
F_N – NULL TERMINATION OR I/O STOP

GLOBAL REGISTERS
RF – FORWARD COPY OF INPUT BUFFER
RP – PREVIOUS COPY OF INPUT BUFFER
RC – COPY OF CURRENT INPUT BUFFER
RD – DIFFERENCE IN X/Y

GLOBAL VARIABLES
VE – BIT EXTENT FOR QUADRATURE (N BITS WIDE)
VQ – QUADRATURE COUNT
VS – ADAPTIVE CONTROL EVENT

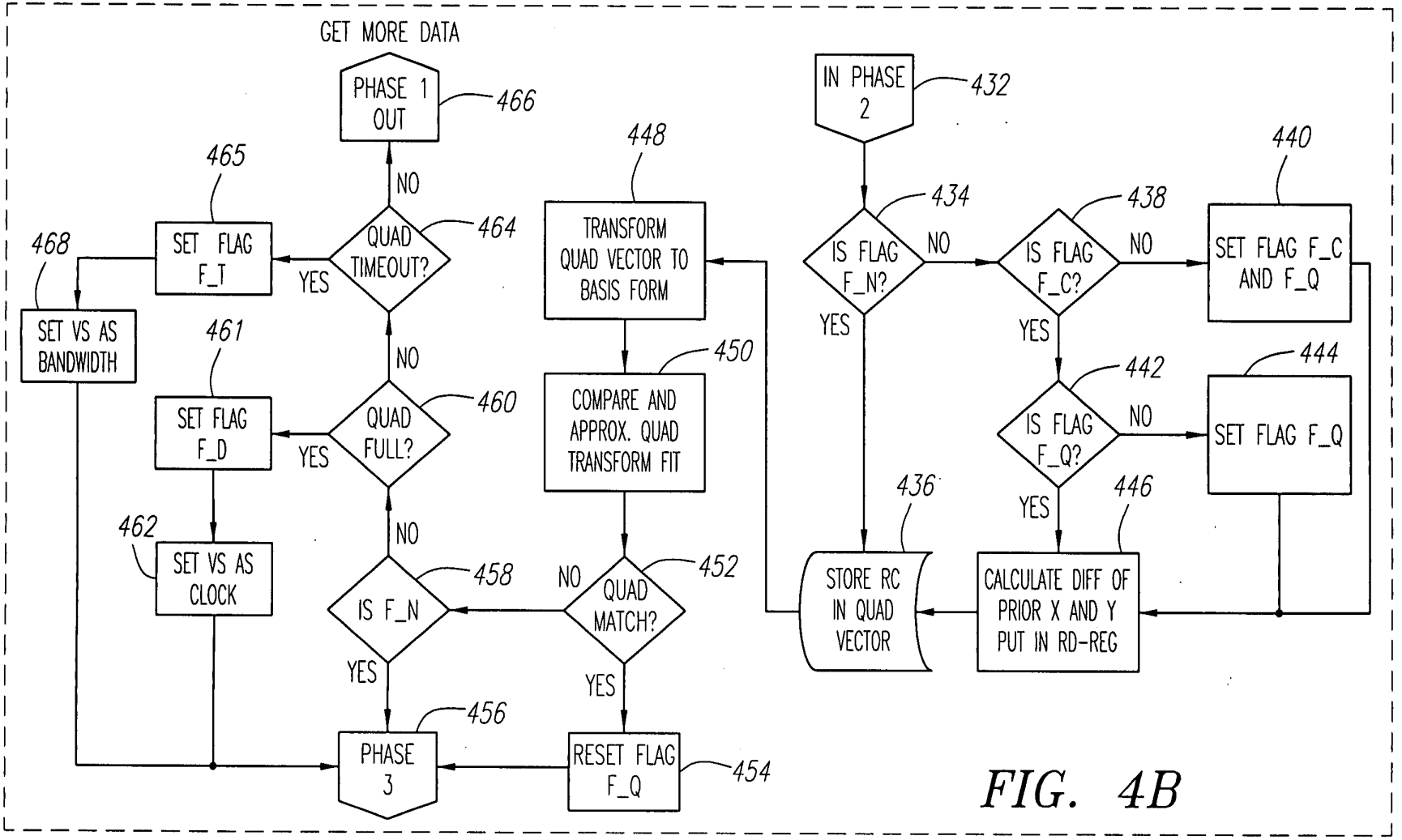


FIG. 4B

FUNCTIONAL DEFINITION OF CELL BLOCKING - PHASE 3

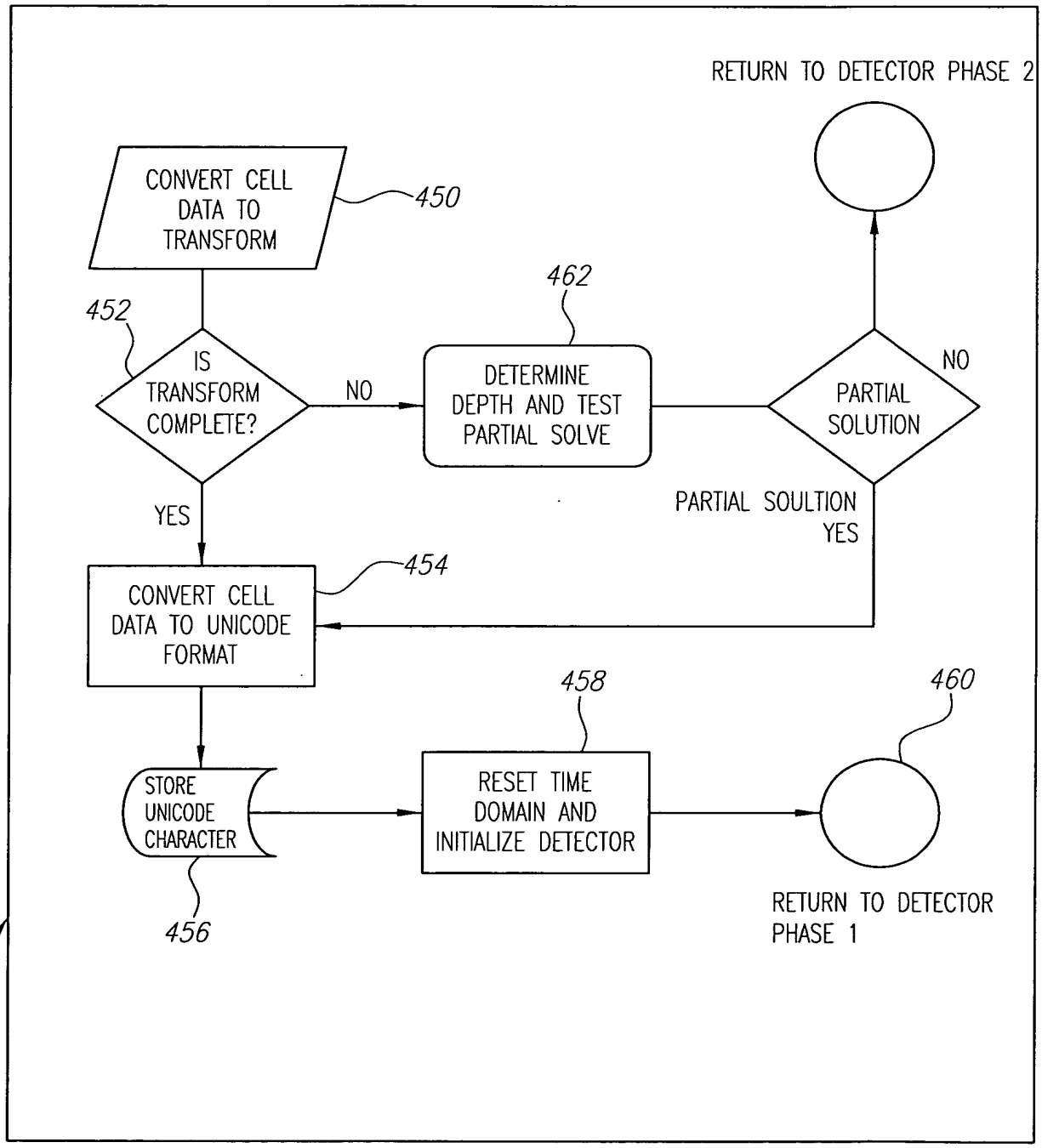


FIG. 4C

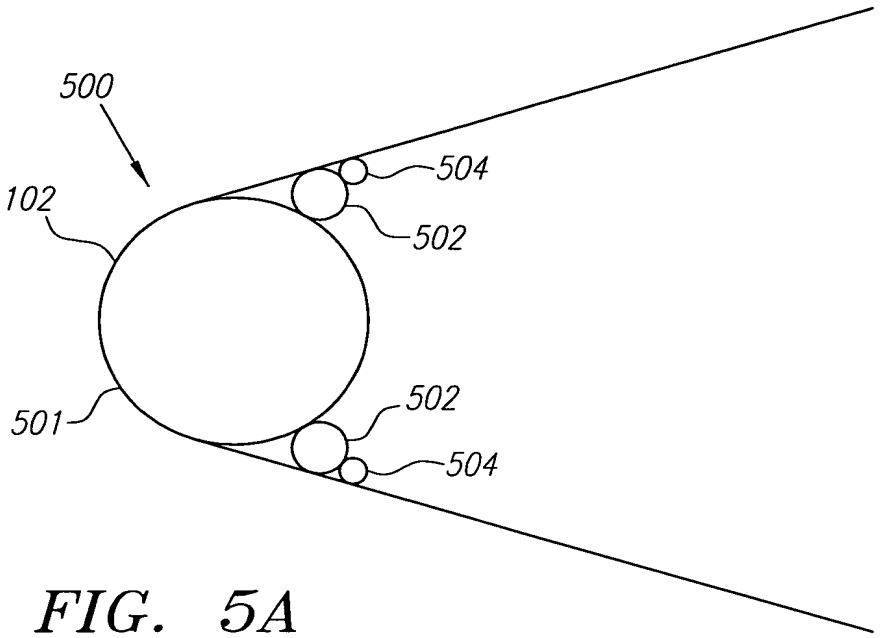


FIG. 5A

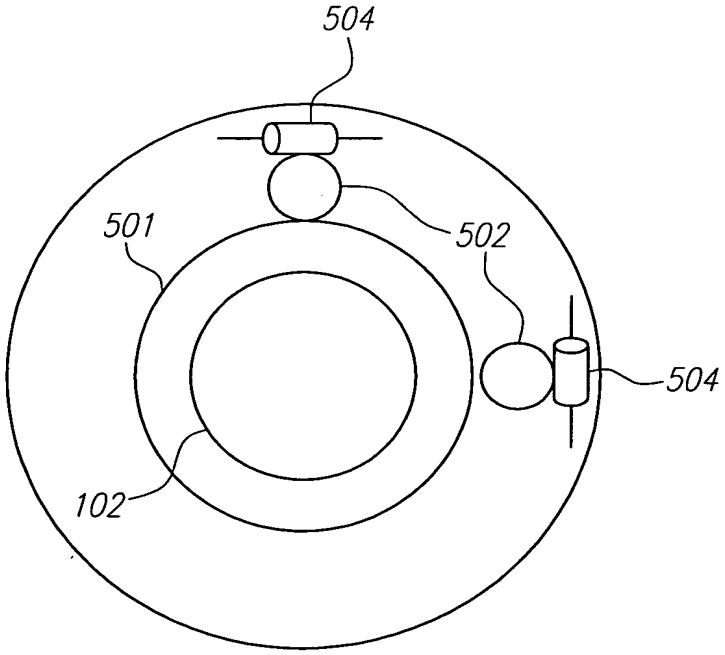


FIG. 5B

MICRO-FEELER – ANALOG SOURCE DATA

COUPLED TO RESISTIVE POTENTIOMETERS THAT ARE
MULTI-TURN CYCLICAL OUTPUT
(NO STOPS ON SHAFT ROTATION)

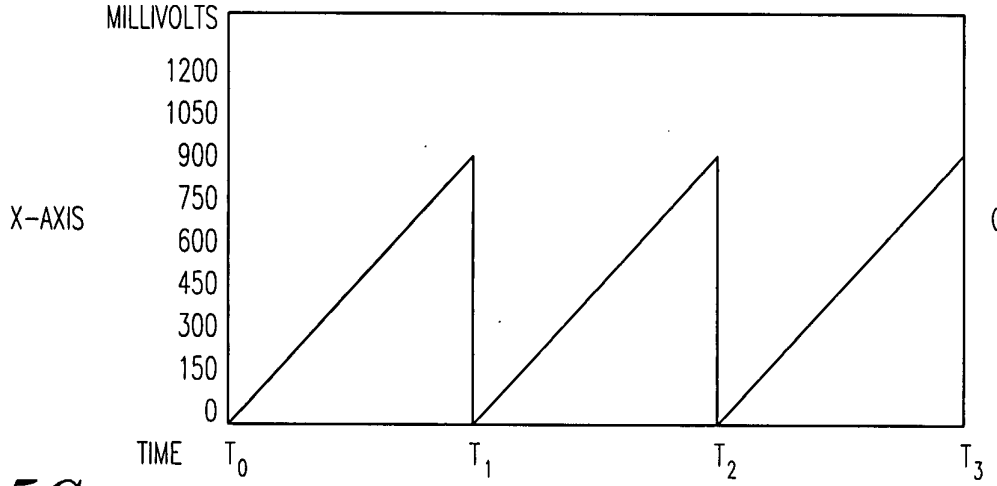
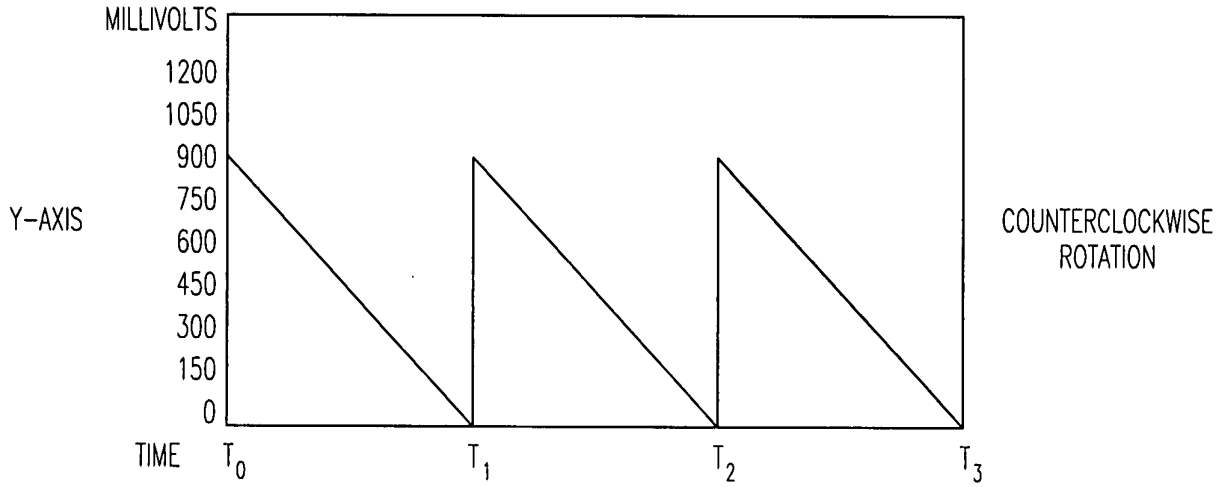


FIG. 5C

RESISTANCE (VOLTS) VERSUS TIME



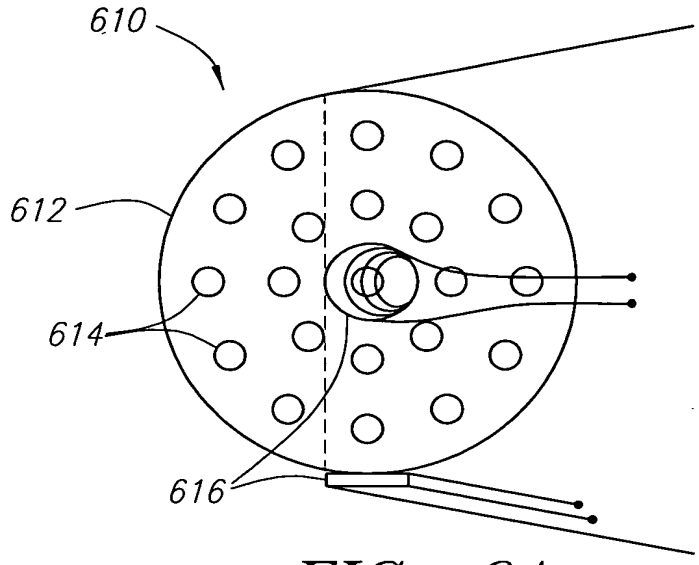


FIG. 6A

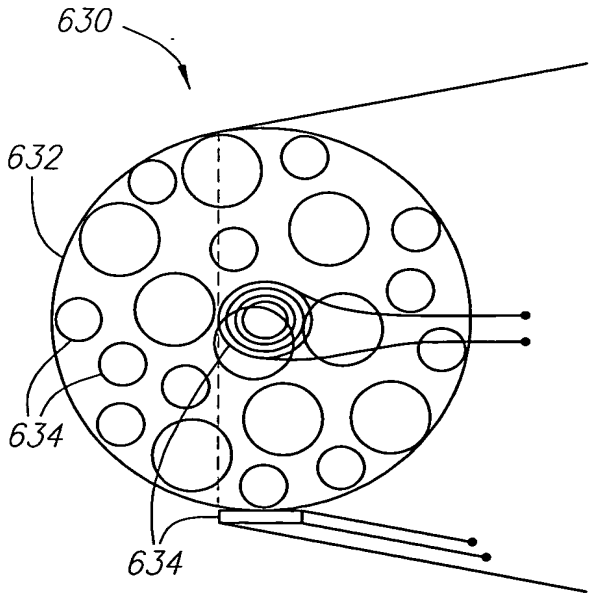


FIG. 6B

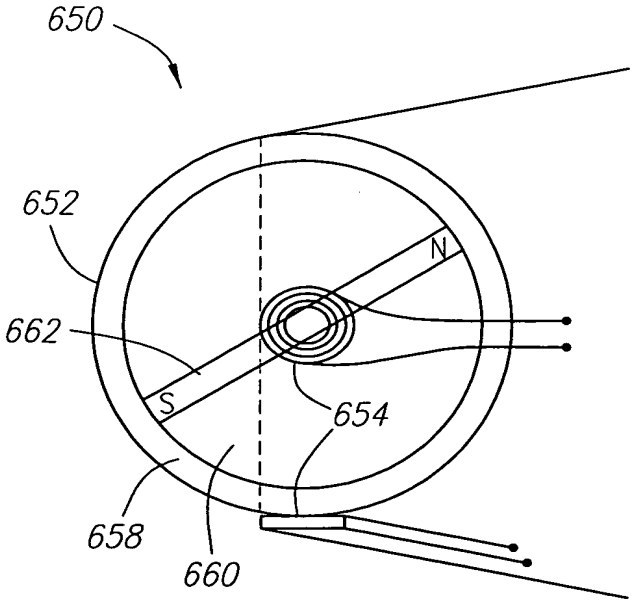
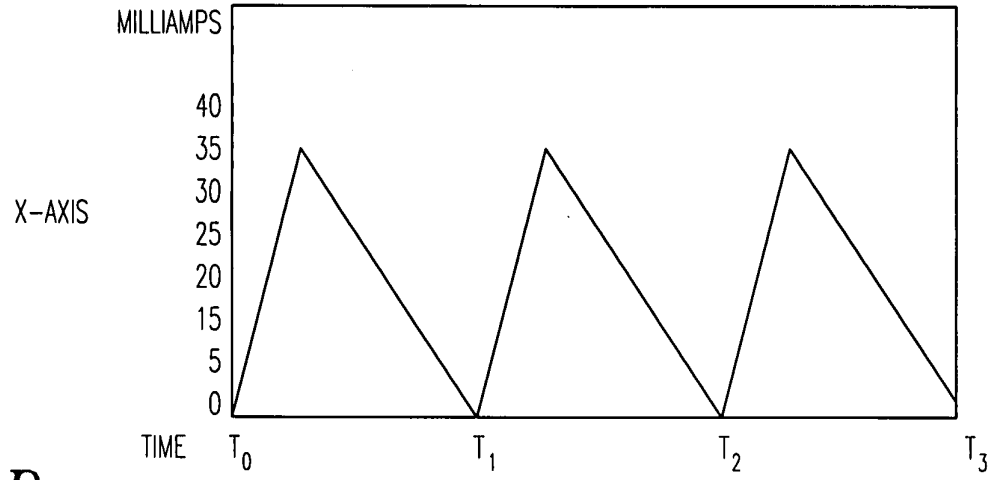
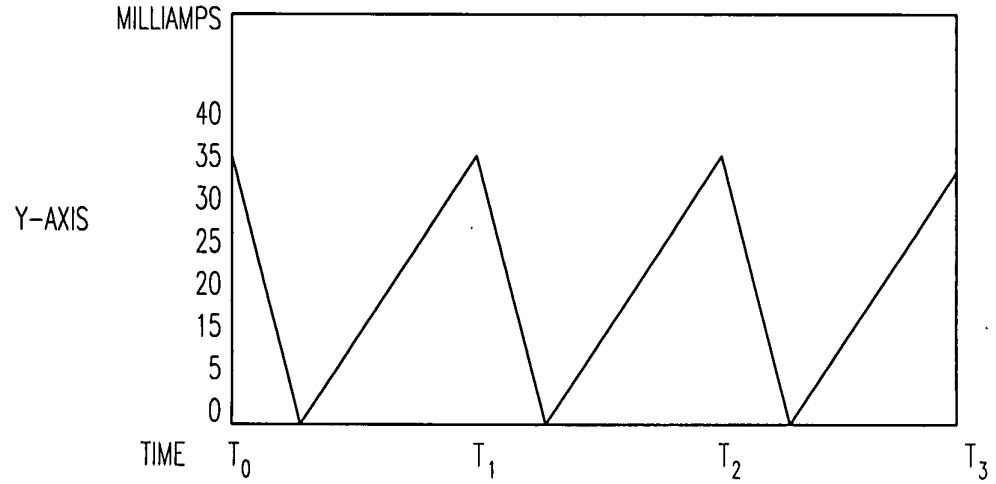


FIG. 6C

SYMMETRIC MULTI-DOMAIN - ANALOG SOURCE DATA

ROTATION OF DOMAINS ON AN AXIS PRODUCE EITHER INCREASING OR DECREASING CURRENTS FROM TIGHT TO LOOSE COIL BINDINGS.





CURRENT VERSUS TIME OUTPUT FROM COIL FOR DIFFERENT MAGNET SWEEPS ACROSS THE COIL,

FIG. 6D

ASYMMETRIC MULTI-DOMAIN - ANALOG SOURCE DATA

MAGNETIC POLES ARE DISTRIBUTED IN A CHARACTERIZED, NON-UNIFORM PATTERN THAT MAPS VARIATIONS OF CURRENT, SLOPE/RISE, AND TIME TO A UNIQUE VALUE.

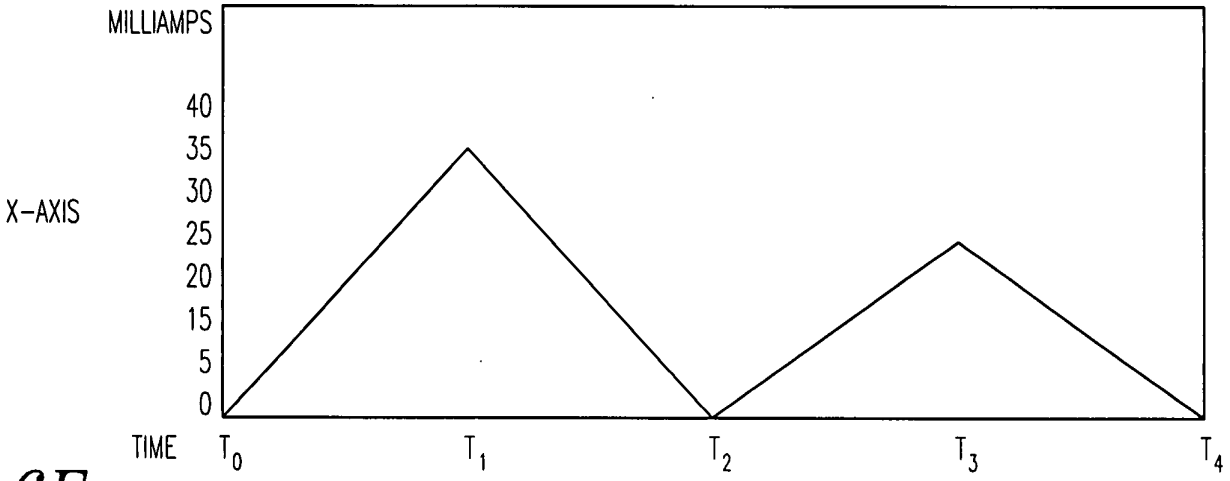
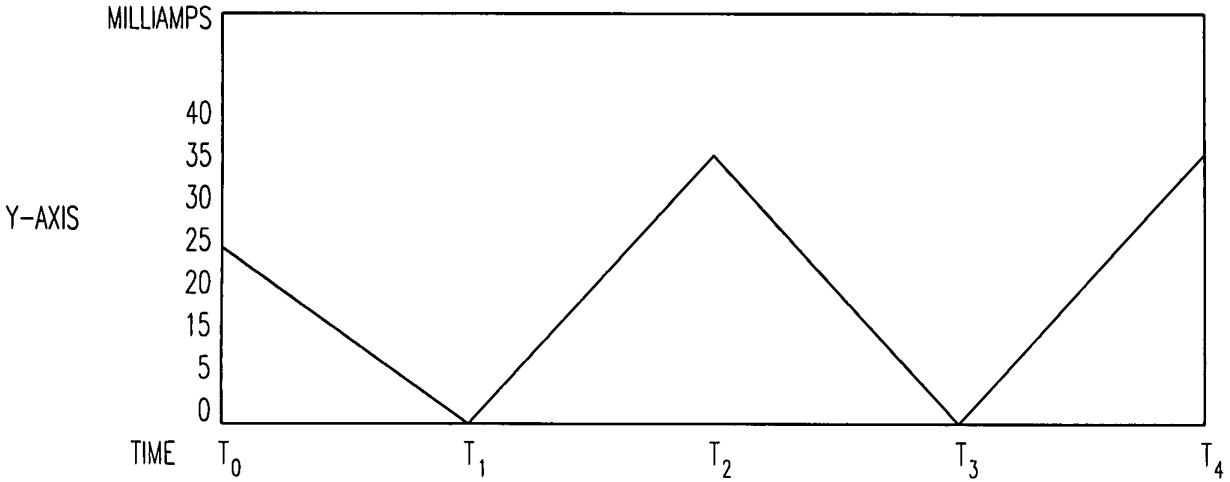


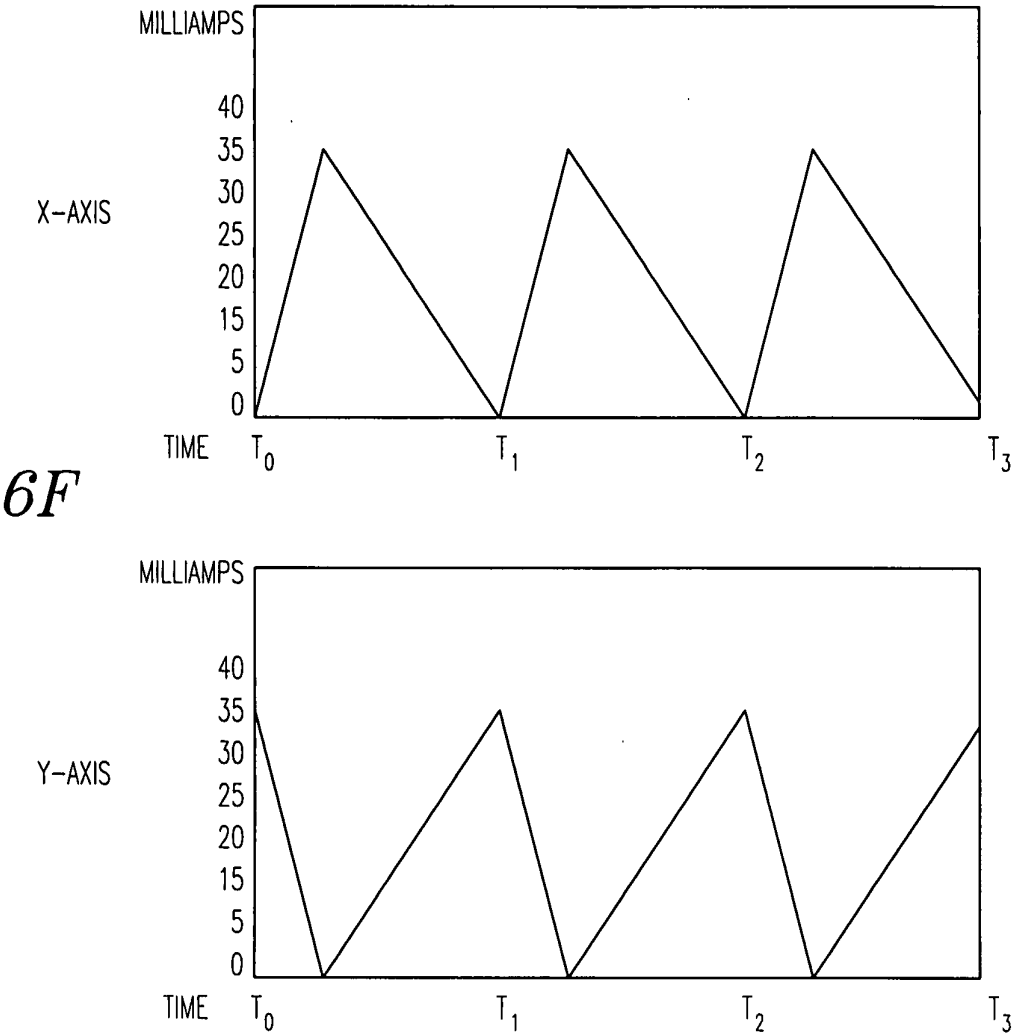
FIG. 6E



CURRENT VERSUS TIME OUTPUT FROM COIL FOR DIFFERENT MAGNET SWEEPS ACROSS THE COIL, AND AS DOMAIN SIZES AND MAGNETIC FIELD STRENGTH VARY SO DOES THE PERIOD

SYMMETRIC UNI-DOMAIN - ANALOG SOURCE DATA

ROTATION OF DOMAINS ON AN AXIS PRODUCE EITHER INCREASING OR DECREASING CURRENTS FROM TIGHT TO LOOSE COIL BINDINGS.



CURRENT VERSUS TIME OUTPUT FROM COIL FOR DIFFERENT MAGNET SWEEPS ACROSS THE COIL,

FIG. 6F

MICRO FEELER OR INDUCTION COIL INPUT DEVICE

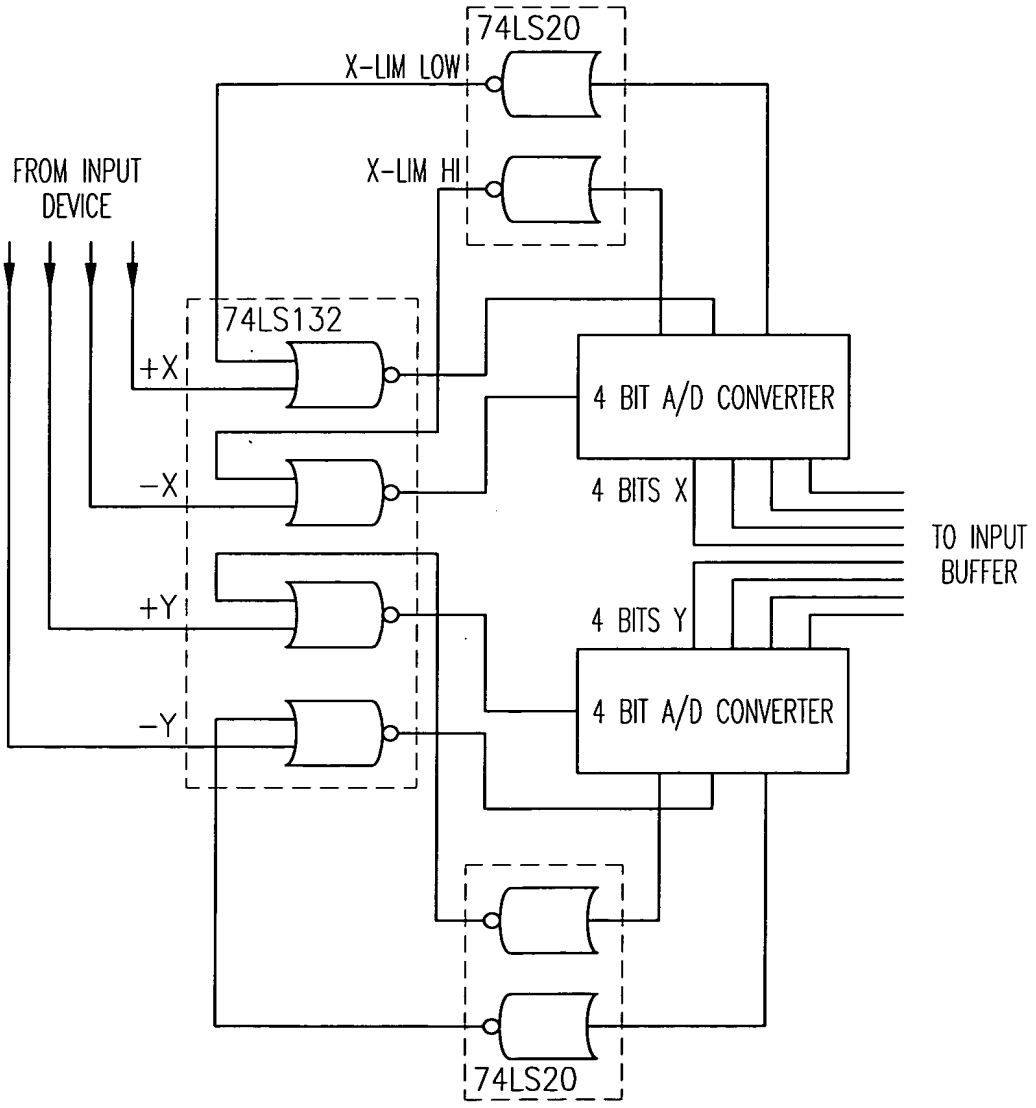


FIG. 7